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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/544,100

04/21/2006

Tsunehiro Takeda

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EXAMINER

DOERRLER, WILLIAM CHARLES

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

09/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--|--|--|
| Office Action Summary | Application No. 10/544,100 | Applicant(s) TAKEDA, TSUNEHIRO | |
| | Examiner William C. Doerrler | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8-2-2005</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Takeda (6,442,948).

Takeda discloses in the paragraph beginning on line 11 of column 5, a transfer line for helium with an inner layer for liquid helium and two outer layers for gaseous helium, with vacuum insulation separating the layers.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2,4,5,7,8,10,11,15-18 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda (6,442,948) in view of Hauser (3,415,069).

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Takeda discloses applicant's basic inventive concept, a circulation type helium recondensation device with a pump used to circulate evaporated helium from a storage tank, recondense the helium and return it to the storage tank, substantially as claimed with the exception of using a helium refiner which freezes impurities and then heats the solid to remove impurities from the helium. Hauser shows this feature to be old in the helium purification art (see particularly lines 13-17 of claim 3 for discussion of heated purge and column 4 line 39 to the end of the column for a discussion of the functioning of the refiner). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Hauser to modify the helium recondenser of Takeda by adding a refiner that freezes and then heats impurities to remove them from the helium stream to provide a purer helium liquid stream. In regard to claim 2, see line 72 of column 4 of Hauser. In regard to claim 16, Official Notice is taken that zigzag passages with conductive fins are well known in the heat transfer art, and as such would have been obvious to an ordinary practitioner in the art to provide efficient heat transfer with area to promote condensation and solidification from the fluid passing through. In regard to claims 17 and 18, it is noted that the outer layer of the conduit of Takeda is corrugated and is thus seen as a bellows. It is noted that applicant has not shown the claimed bellows in the figures. The figures have not been objected to however, as bellows are seen as well known in the art and obvious to any ordinary practitioner in the art. In regard to claims 23, 24 and 25, Official Notice is taken that pressure and flow velocity are well known parameters to determine proper flow and therefore would have been obvious to an ordinary practitioner in the art to determine

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regeneration times due to reduction of flow due to blockages caused by the solidification of impurities. The refiner of Hauser performs heating, cooling, circulation recovery and liquid level recovery as described in the above citation in column 4.

Claims 3,6,9,12-14,21,22,28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda in view of Hauser as applied to claims 1,2,4,5,7,8,10,11,15-18 and 23-27 above, and further in view of Arslanian (6,345,451).

Takeda, as modified, discloses applicant's basic inventive concept, a helium recirculation system with purifying means that heats impurities and delivers purified liquid helium back to the storage tank, substantially as claimed with the exception of using mass flow controllers and means to store the refined helium. Arslanian shows these features to be old in the helium purification art with mass flow sensor 12 and storage tanks 24 and 26. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Arslanian to modify the helium recirculation device of Takeda by using mass flow controllers to ensure proper amounts of flow through the system and to use storage tanks to permit the storage of refined helium to ensure an adequate supply during all parts of the refining cycle. In regard to claims 12,13 and 22, Official Notice is taken that pressure and flow velocity are well known parameters to determine proper flow and therefore would have been obvious to an ordinary practitioner in the art to determine regeneration times due to reduction of flow due to blockages caused by the solidification of impurities. In regard to claim 21, Official Notice is taken that electromagnetic valves are well known and as such would

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have been obvious to an ordinary practitioner in the art to derive a system which is easily controlled.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda in view of Goddard et al (5,992,158).

Takeda discloses applicant's basic inventive concept, a conduit for cryogenic fluids with three coaxial passages, substantially as claimed with the exception of using a heater at the end of the conduit. Goddard shows this feature to old in the conduit for cryogenic fluids art in line 14 of column 5 and line 1 of column 10. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Goddard et al to modify the cryogenic conduit of Takeda by using a heater on the end of the conduit to prevent the freezing of fluids outside, as well as inside the conduit to ensure proper flow and a quickly releasable connection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ward shows a conduit for cryogenic fluids. Hood shows a helium cooler. Molitor and Lehmer et al show purifiers. Koeppe et al show a separator which solidifies impurities.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

William C Doerrler
Primary Examiner
Art Unit 3744

WCD

/William C Doerrler/
Primary Examiner, Art Unit 3744